remaining in the sequence. If additional data items exist, then the operation returns to step 1314 and an additional data item is output. If at step 1318 there are no more additional data items in the sequence to be output, then the operation progresses to a step 1322 to indicate that the sequence is complete.

5      It should be noted that in the methods of Figures 12 and 13, the sequence may be generated and transmitted once, generated numerous times and sequentially transmitted numerous times, or generated or transmitted in some pattern with a period of silence between one or more sequence transmissions.

Figure 14 illustrates an example method of operation of one embodiment of the

10    invention. This is but one example embodiment. It is contemplated that other methods of operation are possible and within the scope of the invention as define by the claims. At a step 1402, the wake-up system (hereinafter system) generates a sequence signal. The sequence signal may comprise an M-sequence or any other type of sequence. In one embodiment, the sequence comprises a sequence with good autocorrelation properties.

15    At a step 1404, the operation performs signal mapping to assign the sequence signal to one of several different values. At a step 1406, the system filters the signal to remove unwanted components. At a step 1410, the system converts the digital sequence signal to an analog format. At a step 1412, the system transmits the sequence signal over a communication channel.

20    At a step 1414 the system monitors for a response from the remotely located communication device on the far end of the channel or line. This monitoring is in

40

anticipation of a response from the communication device that is receiving the sequence signal generated at step 1406.

At a step 1420 the receiver receives the sequence signal. Of course, at this point the receiver does not know if it is a sequence signal, or simply noise on the line.

5      Accordingly, at step 1422, the receiver correlates the received signal. As a result of the correlation, a correlated signal is created. This correlated signal is compared, at a step 1424, to a reference signal or reference data regarding a known correlated signal representing a wake-up or activation sequence signal. By way of example, the correlated signal will have peaks or signal characteristics. These signal characteristics are compared

10     to the threshold signal to determine if a wake-up signal has been received. If at decision step 1430 the correlated signal is not above the threshold then the operation progresses to a step 1432 wherein the operation returns to step 1400. Hence, by jumping to step 1400 the operation has determined that the correlated signal received over the channel is not a wake-up signal or does not qualify as a wake-up signal.

15     If at step 1430 the correlated signal is above the threshold or sufficiently matches the threshold signal, then the operation progresses to step 1436 wherein the device that began as a receiver of the wake-up signal now acts as a transmitter by generating and transmitting an acknowledgement signal, which may be in the form of a sequence signal, to the device that originally acted as the transmitter.

20     Returning to the transmitter (left) side of Figure 14 at a step 1440, the device that originally transmitted the signal receives the acknowledgement signal. Turning to Figure

14B, at a step 1444, the acknowledgement signal is correlated. Thereafter, the correlated acknowledgement signal is compared to another threshold signal. The threshold signal may be the same as the prior threshold or a different threshold. It is contemplated that the threshold may be dependent upon the sequence signal that is transmitted as the wake-up signal and/or the acknowledgement signal.

At decision step 1450, a determination is made whether the acknowledgement signal is above or sufficiently close to the threshold to qualify as an acknowledgement signal. If it is not above or sufficiently close to the threshold, then the operation progresses to a step 1452. At step 1452, there is a time-out decision block. If a time period for acknowledgement passes, i.e. times-out, then the operation ends and it is assumed no wake-up will occur because no acknowledgement signal was receive. In contrast, if at step 1452 the time-out time has not expired, then the operation progresses to a step 1452 and the process listens or waits for an acknowledgement signal. This process continues between step 1452 and step 1454 until the time-out period expires.

If at step 1450 the acknowledgement signal is at or above the threshold, then the operation progresses to a step 1460 wherein the warm start process is initiated. Other actions may be taken other than a warm start operation if a wake-up signal is detected. Moreover, it is contemplated that a warm start process may occur which needs an acknowledgement signal process.

Figure 15 illustrates an operational flow diagram of an alternative method of operation. In the method described in Figure 15, channel analysis is performed in